

anterior margin. The corpora quadrigemina are large, especially in front.

The cerebellum is just overlapped at its anterior border by the back of the cerebral hemispheres; otherwise it is quite posterior.

The several lemurine resemblances of *Tupaia* makes the simplicity of its cerebral surface somewhat surprising.

5. Notes on the Anatomy of *Helictis subaurantiaca*. By A. H. GARROD, M.A., F.R.S., Prosector to the Society.

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(Plate XXIX.)

A specimen of *Helictis subaurantiaca*, from China, purchased by the Society on Nov. 26, 1874<sup>1</sup>, having died on Nov. 29, 1878, I take the present opportunity of recording some of the most important facts in its visceral anatomy, more on account of the rarity of the animal in this country, than because it presents peculiarities of any kind.

It may first be noticed that the skins of this species collected by Mr. Swinhoe, and now in the national collection, seem to have faded very much in their underparts, which, quite in opposition to that naturalist's original account of his species, are a pure white. It may further be mentioned that *Helictis* is extremely Badger-like in its proportions, gait, and odour.

On comparing the skull of the Society's specimen with the small collection of skulls of the genus in the national collection, I found no small difficulty in detecting any intimate resemblance to any. In most of its measurements it agrees exactly with those of *H. moschata*, as recorded by Dr. Gray<sup>2</sup>.

In the Society's specimen the skull retained no trace of any sutures, and the lower jaw was considerably diseased, apparently in association with decay of the teeth. I hardly think, however, that extreme old age will account for the peculiarities of the individual under consideration. It differs from other specimens of *H. moschata* and *H. subaurantiaca*, and much more resembles *H. nipalensis* and *H. orientalis*, in that its zygoma is massive, the premaxillary region short as well as comparatively broad, and the mid-parietal area between the upper margins of the temporal muscular origins decidedly broad. The premolar and molar teeth are heavier than in *H. moschata* and *H. subaurantiaca*, lighter than in *H. nipalensis* and *H. orientalis*, with the two former of which species it most agrees in the size of the zygomatic foramen, with the two latter in its situation.

<sup>1</sup> Vide P. Z. S. 1874, p. 666.

<sup>2</sup> Catalogue of Carnivorous, Pachydermatous, and Edentate Mammalia in the British Museum, 1869, p. 143.

The following were the measurements, taken a few hours after death :—

	inches.
Tip of nose to base of tail .....	14·25
Tail .....	6·9
Ear .....	1·4
Tip of nose to occipital ridge .....	3·8
Sex, female.	

The two pairs of inguinal nipples are widely separate, forming the four corners of a square.

The clavicles are reduced, each ·3 inch long, the scapular extremities remaining.

The tongue is covered with small, similar, retroverted filiform papillæ, with a fair scattering of fungiformes. The papillæ circumvallatæ, two on the left, three on the right, and one in the angle, form the usual V.

The right lung has four lobes, one being the azygos. On the left side there only two lobes.

The stomach is exactly like that of *Arctictis binturong* (as figured by me<sup>1</sup>) and nearly all Carnivora when contracted. The small intestine is seven feet in length, the large intestine six inches and three quarters. There is no cæcum; but an abrupt change in the nature of the mucous membrane from thin and villous to thick and smooth indicates the junction of the tubes.

The liver conforms completely to the carnivorous type, the right central lobe being largest, with a deep cystic fissure, and a gall-bladder so deeply imbedded that its fundus is seen on the diaphragmatic surface of the organs. The left lateral lobe comes next in size, the right central, and then the caudate following, after which the left central lobe, and the small Spigelian last.

The pancreas is seven inches in length, its left terminal two inches being in relation with the narrow spleen (two and three quarters inches in length).

There is a pair of pea-sized anal glands, opening into the rectum near the sphincter, in a linear transverse orifice on either side.

The uterus is strongly bicorn; the vulva much enlarged, with a well developed gland on each side of the orifice of the meatus urinarius.

The brain conforms to the Musteline Carnivorous type, not to that of most of the Arctoidea. In Prof. Flower's excellently concise definitions of the three different arrangements of the cerebral convolutions in the Carnivora<sup>2</sup>, he tells us that "in the *Arctoidea* the fissure of Sylvius is rather long, and slopes backwards; the inferior gyrus has the limbs long, corresponding with the length of the Sylvian fissure, the anterior rather narrower than the posterior (especially in the true Bears); the middle gyrus is moderate and equal-limbed, the upper one large, very broad in front, and distinctly marked off from the second posteriorly as far as near the lower

<sup>1</sup> P. Z. S. 1873, p. 198.

<sup>2</sup> P. Z. S. 1869, p. 482.

border of the temporal lobe (‡). The crucial fissure is long and oblique, and situated further back than usual." In the footnote (‡) we read, "Except in the smaller numbers of the genus *Mustela*, where the sulcus separating the superior from the middle gyrus is less produced posteriorly than in others of the group. In *Galictis vittata*, however, the brain is quite a miniature of that of a Bear; but the middle convolution is united with the upper one at its superior anterior angle.

Fig. 1.

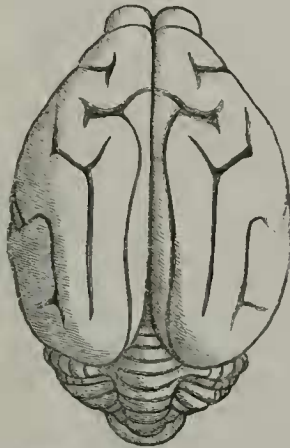
Brain of *Helictis subaurantiaca*; superior aspect.

Fig. 2.

Brain of *Helictis subaurantiaca*; lateral aspect.

In *Helictis*, as also in *Ictonyx zorilla*, the superior gyrus ceases at the superior posterior angle of the hemisphere, as in *Mustela*. The anterior limb of the inferior gyrus is extremely narrow, especially near its upper end, where it becomes almost hidden by the corresponding part of the posterior limb of the same gyrus. A small sulcus tends to divide the transverse part of the middle gyrus from its posterior limb.

Most peculiarly, in *Helictis* there is no crucial fissure, because the hippocampal gyrus appears upon the superior aspect of the brain. This is the case in no other carnivorous animal with which I am acquainted, but occurs in *Moschus*, *Cervus pudu*, and other smaller Ruminantia.